CPC COOPERATIVE PATENT CLASSIFICATION

F23B METHODS OR APPARATUS FOR COMBUSTION USING ONLY SOLID FUEL (for combustion of fuels that are solid at room temperatures, but burned in melted form, e.g. candle wax, C11C 5/00, F23C, F23D ; using solid fuel suspended in air F23C, F23D 1/00 ; using solid fuel suspended in liquids F23C, F23D 11/00; using solid fuel and fluent fuel simultaneously or alternately F23C, F23D 17/00; [N: burning of low grade fuel F23G; grates F23H; feeding solid fuel to combustion apparatus F23K; combustion chambers, not otherwise provided for F23M; domestic apparatus F24; central heating boilers F24D; package boilers F24H)

NOTE

This subclass is only concerned with the combustion of lump fuel, or of pulverulent or granulated fuel if no use is made of its fluent nature.

IPC7 groups

F23B 1/00 Combustion apparatus using only lump fuel

F23B 1/02 . for indirect heating of a medium in a vessel, e.g. for boiling water(steam generationF22)
F23B 1/04 . . External furnaces, i.e. with furnace in front of the vessel
F23B 1/06 . . . for heating water-tube boilers, e.g. Tenbrink flue furnaces
F23B 1/08 . . Internal furnaces, i.e. with furnaces inside the vessel
F23B 1/10 . . . for heating locomotive boilers
F23B 1/12 . . with a plurality of combustion chambers

F23B 1/16 . the combustion apparatus being modified according to the form of grate or other fuel support{for incineratorsF23G 5/002}
F23B 1/165 . . {using roller grate}
F23B 1/18 . . using inclined grate
F23B 1/20 . . using step-type grate
F23B 1/22 . . using travelling grate
F23B 1/24 . . using rotating grate
F23B 1/26 . . using imperforate fuel supports
F23B 1/28 . . using ridge-type grate, e.g. for combustion of peat, sawdust, or pulverulent fuel{(combustion of peat, sawdust F23G 7/10)}

F23B 1/30 . characterised by the form of combustion chamber
F23B 1/32 . . rotating
F23B 1/34 . . annular
F23B 1/36 . . shaft-type
F23B 1/38 . . for combustion of peat, sawdust, or pulverulent fuel on a grate or other fuel

{(combustion of peat, sawdust F23G 7/10)}

F23B 3/00 **Combustion apparatus which is portable or removable with respect to the boiler or other apparatus which is heated**

F23B 5/00 **Combustion apparatus with arrangements for burning uncombusted material from primary combustion** {(combustion apparatus characterised by the combination of two or more combustion chambers F23C 6/00; the primary combustion being pulverulent fuel **F23B 9/00B**)}

F23B 5/02 . in main combustion chamber

F23B 5/025 . . {recirculating uncombusted solids to combustion chamber}

F23B 5/04 . in separate combustion chamber; on separate grate

F23B 7/00 **Combustion techniques; Other solid-fuel combustion apparatus**

F23B 7/002 . {characterised by gas flow arrangements}

F23B 7/005 . . {with downdraught through fuel bed and grate}

F23B 7/007 . . {with fluegas recirculation to combustion chamber}

F23B 10/00 **Combustion apparatus characterised by the combination of two or more combustion chambers**

F23B 10/02 . including separate secondary combustion chambers

WARNING

Group F23B 10/02 is not complete pending a reorganisation. See also groups F23B 10/00

F23B 20/00 **Combustion apparatus specially adapted for portability or transportability**

F23B 30/00 **Combustion apparatus with driven means for agitating the burning fuel; Combustion apparatus with driven means for advancing the burning fuel through the combustion chamber**

F23B 30/02 . with movable, e.g. vibratable, fuel-supporting surfaces; with fuel-supporting surfaces that have movable parts

F23B 30/04 . . with fuel-supporting surfaces that are rotatable around a horizontal or inclined axis and support the fuel on their inside, e.g. cylindrical grates

F23B 30/06 . . with fuel supporting surfaces that are specially adapted for advancing fuel throught the combustion zone

F23B 30/08 . . . with fuel-supporting surfaces that move through the combustion zone, e.g. with chain grates

F23B 30/10 . . . with fuel-supporting surfaces having fuel advancing elements that are movable, but remain essentially in the same place, e.g. with rollers or reciprocating grate bars

F23B 40/00 Combustion apparatus with driven means for feeding fuel into the combustion chamber

F23B 40/02 . the fuel being fed by scattering over the fuel-supporting surface

F23B 40/04 . the fuel being fed from below through an opening in the fuel-supporting surface

F23B 40/06 . the fuel being fed along the fuel-supporting surface

F23B 40/08 . . into pot- or through-shaped grates

F23B 50/00 Combustion apparatus in which the fuel is fed into or through the combustion zone by gravity, e.g. from a fuel storage situated above the combustion zone

F23B 50/02 . the fuel forming a column, stack or thick layer with the combustion zone at its bottom

F23B 50/04 . . the movement of combustion air and flue gases being substantially transverse to the movement of the fuel

F23B 50/06 . . the fuel gases being removed downwards through one or more openings in the fuel-supporting surface

F23B 50/08 . . with fuel-deflecting bodies forming free combustion spaces inside the fuel layer

F23B 50/10 . . with the combustion zone at the bottom of fuel-filled conduits ending at the surface of a fuel bed

F23B 50/12 . the fuel being fed to the combustion zone by free fall or by sliding along inclined surfaces, e.g. from a conveyer terminating above the fuel bed

F23B 60/00 Combustion apparatus in which the fuel burns essentially without moving

F23B 60/02 . with combustion air supplied through a grate

F23B 70/00 Combustion apparatus characterised by means returning solid combustion residues to the combustion chamber

F23B 80/00 Combustion apparatus characterised by means creating a distinct flow path for flue gases or for non-combusted gases given off by the fuel

F23B 80/02 . by means for returning flue gases to the combustion chamber or to the combustion zone

F23B 80/04 . by means for guiding the flow of flue gases, e.g. baffles

F23B 90/00 Combustion methods not related to a particular type of apparatus

NOTE

Groups F23B 90/00 - F23B 90/08 correspond to IPC2012.01

WARNING

Groups F23B 90/00 to F23B 90/08 are not complete pending a reorganisation. See also groups F23B 1/00 to F23B 7/007

F23B 90/02 . Start-up techniques

F23B 90/04 . including secondary combustion (in separate combustion chambers F23B 10/02)

F23B 90/06 . . the primary combustion being a gasification or pyrolysis in a reductive atmosphere

F23B 90/08 . . in the presence of catalytic material

F23B 99/00 Subject matter not provided for in other groups of this subclass

F23B 2101/00 Adaptation of combustion apparatus to boilers in which the combustion chamber is situated inside the boiler vessel, e.g. surrounded by cooled surfaces

Indexing scheme related to adaptation of combustion apparatus to boilers

F23B 2103/00 Adaptation of combustion apparatus for placement in or against an opening of a boiler, e.g. for replacing an oil burner

F23B 2103/02 . for producing an essentially horizontal flame

F23B 2700/00 Combustion apparatus for solid fuel

F23B 2700/003 . adapted for use in water-tube boilers

F23B 2700/004 . adapted for use in Tenbrink boilers

F23B 2700/005 . adapted for use in locomotives

F23B 2700/006 . Details of locomotive combustion apparatus

F23B 2700/007 . with pressurised combustion chambers

F23B 2700/008 . with interchangeable combustion chambers

F23B 2700/009 . adapted for use in various steam boilers

F23B 2700/01 . adapted for boilers built up from sections

F23B 2700/011 . with fuel shaft for steam boilers

F23B 2700/012 . with predrying in fuel suply area

F23B 2700/013 . for use in baking ovens or cooking vessels

F23B 2700/014 . for use in reverberatory furnaces

F23B 2700/018 . with fume afterburning by staged combustion

F23B 2700/022 . with various types of fume afterburners

F23B 2700/023 . with various arrangements not otherwise provided for

F23B 2700/037 . Burners for solid or solidified fuel, e.g. metaldehyde blocks

F23B 2900/00 **Special features of, or arrangements for combustion apparatus using solid fuels; Combustion processes therefor**

F23B 2900/00001 . Combustion chambers with integrated fuel hopper

F23B 2900/00003 . Combustion devices specially adapted for burning metal fuels, e.g. Al or Mg

F23B 2900/00004 . Means for generating pulsating combustion of solid fuel

F23B 2900/00005 . Means for applying acoustical energy to flame

F23B 2900/00006 . Means for applying electricity to flame, e.g. an electric field

F23B 2900/99001 . Retrofitting or converting solid fuel stoves to gas or liquid fuels